＃ 11

PCT10

RAW SEQUENCE LISTING   DATE: 06/06/2002
PATENT APPLICATION: US/10/018,730A   TIME: 12:55:54

Input Set : A:\P02353US1.txt
Output Set: N:\CRF3\06062002\J018730A.raw   ENTERED

```
 3 <110> APPLICANT: Luet, Wong
 4         Jonathan, Jones
 6 <120> TITLE OF INVENTION: PROCESS FOR OXIDISING AROMATIC COMPOUNDS
 8 <130> FILE REFERENCE: P02353US1 / 10112404 / N.76277B
10 <140> CURRENT APPLICATION NUMBER: US 10/018,730A
C--> 11 <141> CURRENT FILING DATE: 2002-04-04
13 <150> PRIOR APPLICATION NUMBER: GB 9914373.7
14 <151> PRIOR FILING DATE: 1999-06-18
16 <150> PRIOR APPLICATION NUMBER: PCT/GB00/02379
17 <151> PRIOR FILING DATE: 2000-06-19
19 <160> NUMBER OF SEQ ID NOS: 18
21 <170> SOFTWARE: PatentIn version 3.1
23 <210> SEQ ID NO: 1
24 <211> LENGTH: 1242
25 <212> TYPE: DNA
26 <213> ORGANISM: Pseudomonas putida
28 <400> SEQUENCE: 1
29 acgactgaaa ccatacaaag caacgccaat cttgcccctc tgccacccca tgtgccagag   60
31 cacctggtat tcgacttcga catgtacaat ccgtcgaatc tgtctgccgg cgtgcaggag  120
33 gcctgggcag ttctgcaaga atcaaacgta ccggatctgg tgtggactcg ctgcaacggc  180
35 ggacactgga tcgccactcg cggccaactg atccgtgagg cctatgaaga ttaccgccac  240
37 ttttccagcg agtgcccgtt catccctcgt gaagccggcg aagcctacga cttcattccc  300
39 acctcgatgg atccgcccga gcagcgccag tttcgtgcgc tggccaacca agtggttggc  360
41 atgccggtgg tggataagct ggagaaccgg atccaggagc tggcctgctc gctgatcgag  420
43 agcctgcgcc cgcaaggaca gtgcaacttc accgaggact acgccgaacc cttcccgata  480
45 cgcatcttca tgctgctcgc aggtctaccg gaagaagata tcccgcactt gaaataccta  540
47 acggatcaga tgacccgtcc ggatggcagc atgaccttcg cagaggccaa ggaggcgctc  600
49 tacgactatc tgataccgat catcgagcaa cgcaggcaga agccgggaac cgacgctatc  660
51 agcatcgttg ccaacggcca ggtcaatggg cgaccgatca ccagtgacga agccaagagg  720
53 atgtgtggcc tgttactggt cggcggcctg gatacggtgg tcaatttcct cagcttcagc  780
55 atggagttcc tggccaaaag cccggagcat cgccaggagc tgatcgagcg tcccgagcgt  840
57 attccagccg cttgcgagga actactccgg cgcttctcgc tggttgccga tggccgcatc  900
59 ctcacctccg attacgagtt tcatggcgtg caactgaaga aaggtgacca gatcctgcta  960
61 ccgcagatgc tgtctggcct ggatgagcgc gaaaacgcct gcccgatgca cgtcgacttc 1020
63 agtcgccaaa aggtttcaca caccaccttt ggccacggca gccatctgtg ccttggccag 1080
65 cacctggccc gccgggaaat catcgtcacc ctcaaggaat ggctgaccag gattcctgac 1140
67 ttctccattg cccccgggtgc ccagattcag cacaagagcg gcatcgtcag cggcgtgcag 1200
69 gcactccctc tggtctggga tccggcgact accaaagcgg ta                     1242
72 <210> SEQ ID NO: 2
73 <211> LENGTH: 414
74 <212> TYPE: PRT
75 <213> ORGANISM: Pseudomonas putida
77 <400> SEQUENCE: 2
```

```
 79 Thr Thr Glu Thr Ile Gln Ser Asn Ala Asn Leu Ala Pro Leu Pro Pro
 80 1               5                   10              15
 83 His Val Pro Glu His Leu Val Phe Asp Phe Asp Met Tyr Asn Pro Ser
 84          20                  25                  30
 87 Asn Leu Ser Ala Gly Val Gln Glu Ala Trp Ala Val Leu Gln Glu Ser
 88          35                  40                  45
 91 Asn Val Pro Asp Leu Val Trp Thr Arg Cys Asn Gly Gly His Trp Ile
 92      50                  55                  60
 95 Ala Thr Arg Gly Gln Leu Ile Arg Glu Ala Tyr Glu Asp Tyr Arg His
 96 65                  70                  75                  80
 99 Phe Ser Ser Glu Cys Pro Phe Ile Pro Arg Glu Ala Gly Glu Ala Tyr
100                  85                  90                  95
103 Asp Phe Ile Pro Thr Ser Met Asp Pro Pro Glu Gln Arg Gln Phe Arg
104                 100                 105                 110
107 Ala Leu Ala Asn Gln Val Val Gly Met Pro Val Val Asp Lys Leu Glu
108          115                 120                 125
111 Asn Arg Ile Gln Glu Leu Ala Cys Ser Leu Ile Glu Ser Leu Arg Pro
112      130                 135                 140
115 Gln Gly Gln Cys Asn Phe Thr Glu Asp Tyr Ala Glu Pro Phe Pro Ile
116 145                 150                 155                 160
119 Arg Ile Phe Met Leu Leu Ala Gly Leu Pro Glu Glu Asp Ile Pro His
120                 165                 170                 175
123 Leu Lys Tyr Leu Thr Asp Gln Met Thr Arg Pro Asp Gly Ser Met Thr
124              180                 185                 190
127 Phe Ala Glu Ala Lys Glu Ala Leu Tyr Asp Tyr Leu Ile Pro Ile Ile
128          195                 200                 205
131 Glu Gln Arg Arg Gln Lys Pro Gly Thr Asp Ala Ile Ser Ile Val Ala
132      210                 215                 220
135 Asn Gly Gln Val Asn Gly Arg Pro Ile Thr Ser Asp Glu Ala Lys Arg
136 225                 230                 235                 240
139 Met Cys Gly Leu Leu Leu Val Gly Gly Leu Asp Thr Val Val Asn Phe
140              245                 250                 255
143 Leu Ser Phe Ser Met Glu Phe Leu Ala Lys Ser Pro Glu His Arg Gln
144              260                 265                 270
147 Glu Leu Ile Glu Arg Pro Glu Arg Ile Pro Ala Ala Cys Glu Glu Leu
148          275                 280                 285
151 Leu Arg Arg Phe Ser Leu Val Ala Asp Gly Arg Ile Leu Thr Ser Asp
152      290                 295                 300
155 Tyr Glu Phe His Gly Val Gln Leu Lys Lys Gly Asp Gln Ile Leu Leu
156 305                 310                 315                 320
159 Pro Gln Met Leu Ser Gly Leu Asp Glu Arg Glu Asn Ala Cys Pro Met
160              325                 330                 335
163 His Val Asp Phe Ser Arg Gln Lys Val Ser His Thr Thr Phe Gly His
164              340                 345                 350
167 Gly Ser His Leu Cys Leu Gly Gln His Leu Ala Arg Arg Glu Ile Ile
168          355                 360                 365
171 Val Thr Leu Lys Glu Trp Leu Thr Arg Ile Pro Asp Phe Ser Ile Ala
172      370                 375                 380
175 Pro Gly Ala Gln Ile Gln His Lys Ser Gly Ile Val Ser Gly Val Gln
```

RAW SEQUENCE LISTING   DATE: 06/06/2002
PATENT APPLICATION: US/10/018,730A   TIME: 12:55:54

Input Set : A:\P02353US1.txt
Output Set: N:\CRF3\06062002\J018730A.raw

```
176 385                390                395                400
179 Ala Leu Pro Leu Val Trp Asp Pro Ala Thr Thr Lys Ala Val
180                405                410
183 <210> SEQ ID NO: 3
184 <211> LENGTH: 3150
185 <212> TYPE: DNA
186 <213> ORGANISM: Bacillus megaterium
188 <400> SEQUENCE: 3
189 atgacaatta aagaaatgcc tcagccaaaa acgtttggag agcttaaaaa tttaccgtta    60
191 ttaaacacag ataaaccggt tcaagctttg atgaaaattg cggatgaatt aggagaaatc   120
193 tttaaattcg aggcgcctgg tcgtgtaacg cgctacttat caagtcagcg tctaattaaa   180
195 gaagcatgcg atgaatcacg ctttgataaa aacttaagtc aagcgcttaa atttgtacgt   240
197 gattttgcag gagacgggtt atttacaagc tggacgcatg aaaaaaattg gaaaaaagcg   300
199 cataatatct tacttccaag cttcagtcag caggcaatga aaggctatca tgcgatgatg   360
201 gtcgatatcg ccgtgcagct tgttcaaaag tgggagcgtc taaatgcaga tgagcatatt   420
203 gaagtaccgg aagacatgac acgtttaacg cttgatacaa ttggtctttg cggctttaac   480
205 tatcgcttta acagctttta ccgagatcag cctcatccat ttattacaag tatggtccgt   540
207 gcactggatg aagcaatgaa caagctgcag cgagcaaatc cagacgaccc agcttatgat   600
209 gaaaacaagc gccagtttca agaagatatc aaggtgatga acgacctagt agataaaatt   660
211 attgcagatc gcaaagcaag cggtgaacaa agcgatgatt tattaacgca tatgctaaac   720
213 ggaaaagatc cagaaacggg tgagccgctt gatgacgaga acattcgcta tcaaattatt   780
215 acattcttaa ttgcgggaca cgaaacaaca agtggtcttt tatcatttgc gctgtatttc   840
217 ttagtgaaaa atccacatgt attacaaaaa gcagcagaag aagcagcacg agttctagta   900
219 gatcctgctc caagctacaa acaagtcaaa cagcttaaat atgtcggcat ggtcttaaac   960
221 gaagcgctgc gcttatggcc aactgctcct gcgttttccc tatatgcaaa agaagatacg  1020
223 gtgcttggag gagaatatcc tttagaaaaa ggcgacgaac taatggttct gattcctcag  1080
225 cttcaccgtg ataaaacaat ttggggagac gatgtggaag agttccgtcc agagcgtttt  1140
227 gaaaatccaa gtgcgattcc gcagcatgcg tttaaaccgt ttggaaacgg tcagcgtgcg  1200
229 tgtatcggtc agcagttcgc tcttcatgaa gcaacgctgg tacttggtat gatgctaaaa  1260
231 cactttgact ttgaagatca tacaaactac gagctggata ttaaagaaac tttaacgtta  1320
233 aaacctgaag gctttgtggt aaaagcaaaa tcgaaaaaaa ttccgcttgg cggtattcct  1380
235 tcacctagca ctgaacagtc tgccaaaaaa gcacgcaaaa aggcagaaaa cgctcataat  1440
237 acgccgctgc ttgtgctata cggttcaaat atgggaacag ctgaaggaac ggcgcgtgat  1500
239 ttagcagata ttgcaatgag caaaggattt gcaccgcagg tcgcaacgct tgattcacac  1560
241 gccggaaatc ttccgcgcga aggagctgta ttaattgtaa cggcgtctta taacggtcat  1620
243 ccgcctgata acgcaaagca atttgtcgac tggttagacc aagcgtctgc tgatgaagta  1680
245 aaaggcgttc gctactccgt atttggatgc ggcgataaaa actgggctac tacgtatcaa  1740
247 aaagtgcctg cttttatcga tgaaacgctt gccgctaaag gggcagaaaa catcgctgac  1800
249 cgcggtgaag cagatgcaag cgacgacttt gaaggcacat atgaagaatg gcgtgaacat  1860
251 atgtggagtg acgtagcagc ctactttaac ctcgacattg aaaacagtga agataataaa  1920
253 tctactcttt cacttcaatt tgtcgacagc gccgcggata tgccgcttgc gaaaatgcac  1980
255 ggtgcgtttt caacgaacgt cgtagcaagc aaagaacttc aacagccagg cagtgcacga  2040
257 agcacgcgac atcttgaaat tgaacttcca aaagaagctt cttatcaaga aggagatcat  2100
259 ttaggtgtta ttcctcgcaa ctatgaagga atagtaaacc gtgtaacagc aaggttcggc  2160
261 ctagatgcat cacagcaaat ccgtctggaa gcagaagaag aaaaattagc tcatttgcca  2220
263 ctcgctaaaa cagtatccgt agaagagctt ctgcaatacg tggagcttca agatcctgtt  2280
265 acgcgcacgc agcttcgcgc aatggctgct aaaacggtct gcccgccgca taagtagag   2340
267 cttgaagcct tgcttgaaaa gcaagcctac aaagaacaag tgctggcaaa acgtttaaca  2400
269 atgcttgaac tgcttgaaaa atacccggcg tgtgaaatga aattcagcga atttatcgcc  2460
```

RAW SEQUENCE LISTING   DATE: 06/06/2002
PATENT APPLICATION: US/10/018,730A   TIME: 12:55:54

Input Set : A:\P02353US1.txt
Output Set: N:\CRF3\06062002\J018730A.raw

```
271 cttctgccaa gcatacgccc gcgctattac tcgatttctt catcacctcg tgtcgatgaa   2520
273 aaacaagcaa gcatcacggt cagcgttgtc tcaggagaag cgtggagcgg atatggagaa   2580
275 tataaaggaa ttgcgtcgaa ctatcttgcc gagctgcaag aaggagatac gattacgtgc   2640
277 tttatttcca caccgcagtc agaatttacg ctgccaaaag accctgaaac gccgcttatc   2700
279 atggtcggac cgggaacagg cgtcgcgccg tttagaggct ttgtgcaggc gcgcaaacag   2760
281 ctaaaagaac aaggacagtc acttggagaa gcacatttat acttcggctg ccgttcacct   2820
283 catgaagact atctgtatca agaagagctt gaaaacgccc aaagcgaagg catcattacg   2880
285 cttcataccg ctttttctcg catgccaaat cagccgaaaa catacgttca gcacgtaatg   2940
287 gaacaagacg gcaagaaatt gattgaactt cttgatcaag gagcgcactt ctatatttgc   3000
289 ggagacggaa gccaaatggc acctgccgtt gaagcaacgc ttatgaaaag ctatgctgac   3060
291 gttcaccaag tgagtgaagc agacgctcgc ttatggctgc agcagctaga agaaaaaggc   3120
293 cgatacgcaa aagacgtgtg ggctgggtaa                                     3150
296 <210> SEQ ID NO: 4
297 <211> LENGTH: 1049
298 <212> TYPE: PRT
299 <213> ORGANISM: Bacillus megaterium
301 <400> SEQUENCE: 4
303 Met Thr Ile Lys Glu Met Pro Gln Pro Lys Thr Phe Gly Glu Leu Lys
304 1               5                   10                  15
307 Asn Leu Pro Leu Leu Asn Thr Asp Lys Pro Val Gln Ala Leu Met Lys
308             20                  25                  30
311 Ile Ala Asp Glu Leu Gly Glu Ile Phe Lys Phe Glu Ala Pro Gly Arg
312         35                  40                  45
315 Val Thr Arg Tyr Leu Ser Ser Gln Arg Leu Ile Lys Glu Ala Cys Asp
316     50                  55                  60
319 Glu Ser Arg Phe Asp Lys Asn Leu Ser Gln Ala Leu Lys Phe Val Arg
320 65                  70                  75                  80
323 Asp Phe Ala Gly Asp Gly Leu Phe Thr Ser Trp Thr His Glu Lys Asn
324             85                  90                  95
327 Trp Lys Lys Ala His Asn Ile Leu Leu Pro Ser Phe Ser Gln Gln Ala
328             100                 105                 110
331 Met Lys Gly Tyr His Ala Met Met Val Asp Ile Ala Val Gln Leu Val
332         115                 120                 125
335 Gln Lys Trp Glu Arg Leu Asn Ala Asp Glu His Ile Glu Val Pro Glu
336     130                 135                 140
339 Asp Met Thr Arg Leu Thr Leu Asp Thr Ile Gly Leu Cys Gly Phe Asn
340 145                 150                 155                 160
343 Tyr Arg Phe Asn Ser Phe Tyr Arg Asp Gln Pro His Pro Phe Ile Thr
344             165                 170                 175
347 Ser Met Val Arg Ala Leu Asp Glu Ala Met Asn Lys Leu Gln Arg Ala
348             180                 185                 190
351 Asn Pro Asp Asp Pro Ala Tyr Asp Glu Asn Lys Arg Gln Phe Gln Glu
352         195                 200                 205
355 Asp Ile Lys Val Met Asn Asp Leu Val Asp Lys Ile Ile Ala Asp Arg
356     210                 215                 220
359 Lys Ala Ser Gly Glu Gln Ser Asp Asp Leu Leu Thr His Met Leu Asn
360 225                 230                 235                 240
363 Gly Lys Asp Pro Glu Thr Gly Glu Pro Leu Asp Asp Glu Asn Ile Arg
364             245                 250                 255
```

```
367 Tyr Gln Ile Ile Thr Phe Leu Ile Ala Gly His Glu Thr Thr Ser Gly
368             260             265             270
371 Leu Leu Ser Phe Ala Leu Tyr Phe Leu Val Lys Asn Pro His Val Leu
372         275             280             285
375 Gln Lys Ala Ala Glu Glu Ala Ala Arg Val Leu Val Asp Pro Ala Pro
376     290             295             300
379 Ser Tyr Lys Gln Val Lys Gln Leu Lys Tyr Val Gly Met Val Leu Asn
380 305             310             315             320
383 Glu Ala Leu Arg Leu Trp Pro Thr Ala Pro Ala Phe Ser Leu Tyr Ala
384             325             330             335
387 Lys Glu Asp Thr Val Leu Gly Gly Glu Tyr Pro Leu Glu Lys Gly Asp
388             340             345             350
391 Glu Leu Met Val Leu Ile Pro Gln Leu His Arg Asp Lys Thr Ile Trp
392         355             360             365
395 Gly Asp Asp Val Glu Glu Phe Arg Pro Glu Arg Phe Glu Asn Pro Ser
396     370             375             380
399 Ala Ile Pro Gln His Ala Phe Lys Pro Phe Gly Asn Gly Gln Arg Ala
400 385             390             395             400
403 Cys Ile Gly Gln Gln Phe Ala Leu His Glu Ala Thr Leu Val Leu Gly
404             405             410             415
407 Met Met Leu Lys His Phe Asp Phe Glu Asp His Thr Asn Tyr Glu Leu
408             420             425             430
411 Asp Ile Lys Glu Thr Leu Thr Leu Lys Pro Glu Gly Phe Val Val Lys
412         435             440             445
415 Ala Lys Ser Lys Lys Ile Pro Leu Gly Gly Ile Pro Ser Pro Ser Thr
416     450             455             460
419 Glu Gln Ser Ala Lys Lys Ala Arg Lys Lys Ala Glu Asn Ala His Asn
420 465             470             475             480
423 Thr Pro Leu Leu Val Leu Tyr Gly Ser Asn Met Gly Thr Ala Glu Gly
424             485             490             495
427 Thr Ala Arg Asp Leu Ala Asp Ile Ala Met Ser Lys Gly Phe Ala Pro
428             500             505             510
431 Gln Val Ala Thr Leu Asp Ser His Ala Gly Asn Leu Pro Arg Glu Gly
432         515             520             525
435 Ala Val Leu Ile Val Thr Ala Ser Tyr Asn Gly His Pro Pro Asp Asn
436     530             535             540
439 Ala Lys Gln Phe Val Asp Trp Leu Asp Gln Ala Ser Ala Asp Glu Val
440 545             550             555             560
443 Lys Gly Val Arg Tyr Ser Val Phe Gly Cys Gly Asp Lys Asn Trp Ala
444             565             570             575
447 Thr Thr Tyr Gln Lys Val Pro Ala Phe Ile Asp Glu Thr Leu Ala Ala
448             580             585             590
451 Lys Gly Ala Glu Asn Ile Ala Asp Arg Gly Glu Ala Asp Ala Ser Asp
452         595             600             605
455 Asp Phe Glu Gly Thr Tyr Glu Glu Trp Arg Glu His Met Trp Ser Asp
456     610             615             620
459 Val Ala Ala Tyr Phe Asn Leu Asp Ile Glu Asn Ser Glu Asp Asn Lys
460 625             630             635             640
463 Ser Thr Leu Ser Leu Gln Phe Val Asp Ser Ala Ala Asp Met Pro Leu
```

VERIFICATION SUMMARY   DATE: 06/06/2002
PATENT APPLICATION: US/10/018,730A   TIME: 12:55:55

Input Set : **A:\P02353US1.txt**
Output Set: **N:\CRF3\06062002\J018730A.raw**

L:11 M:271 C: Current Filing Date differs, Replaced Current Filing Date